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Deprivation, winter season, and COPD exacerbations

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COPD exacerbations are a major cause of hospital admissions, especially during the winter months. They are mainly attributed to the increase in respiratory viral infections, though clearly other factors must also play a part. Some patients with COPD have particular susceptibility to frequent exacerbations, and this patient group is especially at risk of hospital admissions, repeat admissions, co-morbidity and deaths.¹

The interesting paper by McAllister and colleagues in this issue of the *PCRJ* examines the additive effect of socio-economic deprivation on seasonal hospital admissions in COPD patients.² The authors found a greater number of winter admissions for COPD in the most deprived compared to the least deprived quintile of the Scottish population (39 versus 7 extra admissions per 10,000 patient years between summer and winter respectively). Previous studies in England and Wales have shown no difference in excess winter deaths between areas with greater or less deprivation or colder housing.³⁻⁶ Indeed, excess winter mortality of working men aged between 50-59 years in the lowest social group (class 5) is lower than any other social class possibly because of their increased activity and that they take precautions against the cold during their manual occupations.⁷

The findings by McAllister and colleagues can be explained by their unique approach to the question. They investigated whether the joint effect differs from the sum of the effects caused individually by temperature and deprivation. Thus, they found that patients with COPD are more likely to be admitted to hospital for an exacerbation beyond what one would expect because it is cold outside and they live

in a deprived area. The cause of these extra admissions could be due to the synergistic effect of poor housing being more expensive to heat.

The study does have implications, as the demands on community care systems will be greater because more of the COPD patients discharged from hospital will be from a socio-economically deprived background. Targeting help for these patients is more problematic; interventional studies have so far failed to show any reduction in mortality or morbidity due to housing and heating upgrades, though improvements have been seen in quality of life indices.⁸ This may be due to the small sample size of these trials performed in the community for practical reasons. Targeting home improvement schemes just at elderly people is also politically difficult – inevitably those elderly people who live with their families will not be as high a priority.

An important limitation of McAllister *et al.*'s study was the use of monthly data. There are fewer admissions to hospital over the weekend and the number of weekends in each month will differ. Also, fewer patients are admitted during Christmas and the New Year periods, and this will affect the hospital admission numbers on a monthly basis.⁹ Cold weather also has a delayed effect on people, with peak mortality from respiratory disease occurring 12 days after peak cold.¹⁰

Though this study showed a disproportionate effect of cold weather on the most deprived, Keatinge¹¹ reported that excess winter deaths in the general population were no different from able bodied elderly people, mainly women, living in warden controlled housing where the costs of heating did not depend on how much the resident used. However, inadequate home heating is not the only cause of winter mortality, and outdoor cold exposure is also important.¹² Wearing suitable protective clothing such as a hat and gloves in cold weather is beneficial but this advice is often neglected by patients. Other reasons are that COPD may be underdiagnosed in patients with socio-economic deprivation and thus this group is more likely to develop more severe exacerbations with a respiratory infection.

McAllister and colleagues report that there were around 30% more hospitalised COPD exacerbations in the winter than in the summer months.² Large well designed public health interventional studies are now needed to investigate these observations further. It is likely that deprivation and season may also interact together to increase COPD exacerbations of mild to moderate severity. Therefore,

it is possible that deprivation may contribute to under-reporting of exacerbations with less chance of treating these events.¹³ Meanwhile, it is important to advise patients – especially those with a history of frequent exacerbations – to take advantage of home insulation grants and to wear warm clothes when going outside the home, as this should reduce winter hospital admissions for COPD exacerbations.

Conflicts of interest The authors declare that they have no conflicts of interest in relation to this article

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Every breath you take

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See linked article by van Gemert *et al.* on pg 300

Cause and effect... How much does it matter what we believe about what causes disease? And what are the implications of not making correct connections between causes and effects? The paper by van Gemert *et al.*¹ in this issue of the *PCRJ* provides interesting insights into the ways in which knowledge, beliefs, and understandings about COPD and its cause and consequences determine the health and wellbeing of individuals and communities.

Chronic obstructive pulmonary disease is a major public health problem globally and a major cause of morbidity and mortality.^{2,3} Currently the fifth leading cause of death globally,⁴ by 2025 it is

projected to become the fourth leading cause, severely affecting those living in low and middle income countries. Increasingly poverty is identified as a risk factor for COPD, but its association with other risk factors for COPD remains unclear.³ Tobacco smoking is the well-established risk factor for development of COPD globally, with an estimated 80-90% risk.^{5,6} The decline in lung function of susceptible smokers is twice that of non-smokers, and the pattern of cigarette smoking has changed globally, rising at a rate of 2% in low income countries.⁷ However, a significant number of patients with COPD, especially in low income countries in Africa, do not smoke, and the main risk factor for COPD in rural areas in Asia, South America and Africa is biomass smoke, where 90% of the rural population rely on biomass fuels for cooking.⁸⁻¹⁰ Other risk factors include previous tuberculosis (TB) infection and other respiratory infections in childhood.¹¹

However, COPD is under-recognised in low and middle income countries by both patients and health professionals.³ This is partly due to lack of diagnostic tools,¹² but it is also due to a lack of knowledge about the nature and the prognosis of the disease, and culturally-influenced attitudes towards the risk factors causing the disease and the symptoms of illness.

In one of the first studies of its kind, van Gemert *et al.*¹ report the views about COPD in a rural district of Uganda, a low income country. Through 10 focus group discussions of groups of women, groups of men, and mixed groups, beliefs, attitudes and understanding of